

BOOK REVIEWS

Incompleteness: The Proof and Paradox of Kurt Gödel by Rebecca Goldstein. Norton, 2005. 296 pp. \$22.95 (hardcover). ISBN 0-3930-5169-2; 224 pp. \$13.95 (paper). ISBN 0-3933-2760-4.

What a wonderful book! Finally, a biographer worthy of Gödel! Finally, Gödel is released from the prison of formal logic and mathematics where he has hitherto been confined! Finally, someone who understands Gödel!

It took Rebecca Goldstein, philosopher and novelist, to realize that Kurt Gödel is not at all, as is commonly stated, "the greatest logician since Aristotle." Actually he is against logic; he is, as I will explain, an irrationalist, a seeker after non-mathematical sources of knowledge. It took a woman of Rebecca Goldstein's considerable talents—she is the author of a delightful novel about genius, *The Mind-Body Problem*, and of a superb book about Spinoza, *Betraying Spinoza*—to realize that both Gödel and Wittgenstein discuss in great detail precisely what is not important to each of them, in one case, formal axiomatic systems, in the other (the *Tractatus*) the power of language. What we can understand is not important; what is important is what we cannot understand. The mystic Wittgenstein, and the seeker after Platonic truths Gödel, did their best to define what really interested them by studying its complement! They try to shed light on what is really important, which is where essentially new knowledge comes from—intuition, inspiration, illumination—not by studying that directly, which is much too difficult, but by studying what it is not. It is most definitely not logic and not mathematical reasoning, which only elaborate what we already know.

In other words, don't think about a conventional mathematician, a hard-working professional who publishes workman-like papers, who makes honest contributions. No, think about Euler and Ramanujan. Where did all their marvelous ideas come from? What mechanism could possibly explain that? And who cares about problem solving; that's trivial! Where do fundamental new concepts come from, how are revolutionary new fields of mathematics created?

Every week Euler published a marvelous paper! Beautiful new mathematics poured in a torrent out of his brain, endlessly. His papers are so clear, they explain his train of thought so well, that you think that you could have written them yourself. But this illusion lasts only as long as you are reading Euler.

How could Euler do this? What source of knowledge did he tap?

And look at Ramanujan, who had no idea what a proof was but who seduced Hardy with his strange and beautiful discoveries, formulas that had to be true, "because a fraud of genius is even more amazing than a mathematician of genius." In fact, Ramanujan tells us where his ideas come from: they are thoughts of God communicated to him by the goddess Namagiri! Understand that, if you can!

Dear reader, I earnestly hope that all this has woken you up, hopefully even shocked you, but maybe I should circle around . . .

Let me start over in a somewhat more conventional manner.

Incompleteness is a very fine book. Goldstein argues convincingly that Gödel was not a mathematician, not at all. He was a philosopher who, to avoid controversy, preferred to use mathematical arguments to make philosophical points, instead of using verbal arguments. He was a philosopher who used mathematics to argue rather than words.

His output is small—for a mathematician—because he worked only on questions he regarded as philosophically significant (not on technical questions or exercises devoid of philosophical interest). It is smaller still, because he spent the last half of his career searching through everything he could get his hands on written by Leibniz or about Leibniz, in an attempt to find a way to prove that the human mind, with its divine spark, is capable of solving any significant mathematical problem in spite of his famous incompleteness theorem. Gödel was sure that the human mind, unlike formal axiomatic systems, is not limited. But how can he convince other people of this?

Indeed, he cannot. He is not satisfied with all his efforts to do this. He produces, one after the other, beautifully worked out "drafts" for papers that he never releases for publication. These fill the third volume of Gödel's *Collected Works*, a much more interesting volume than the first and second volumes, which merely reprint published papers, and the fourth and fifth volumes, which collect correspondence.

In the third volume of Gödel's *Collected Works*, he speaks his mind, he elaborates his philosophical position, he ponders creativity and intuition; he rejects empirical science and materialism. Let me paraphrase a wonderful story told by Goldstein. After giving Gödel a long explanation of an important scientific advance, a dinner companion is shocked into silence by Gödel's brief reaction: "I don't believe in empirical science, I only believe in *a priori* truth!"

The novelist Goldstein relates the drama, Gödel's terrible drama, to be universally acclaimed and totally misunderstood. Everything he thought was important in his work is ignored; everything that he thought was trivial is portrayed as profound!

What a fate! And what a wonderful book Rebecca Goldstein has given us. Extremely provocative and a rare gift in these dumbed-down, unintellectual, overspecialized, too-narrowly focused times!

Let me end with a list of recent books that discuss sources for new ideas. Paradox and ambiguity: Byers, *How Mathematicians Think*. Randomness: Chaitin, *Meta Math!* Experimental mathematics: Bailey et al., *Experimental Mathematics in Action*, and Chaitin, *Thinking about Gödel and Turing*. On illumination, inspiration, and mystical experience, I haven't a clue. Maybe, as Gödel believed, we do indeed contain a divine spark. Or maybe fruitful combinations of ideas collide and then bubble out of the subconscious Maybe we ourselves are but ideas.

Also highly recommended, and discussing related questions, the superb 90-minute BBC TV program by David Malone *Dangerous Knowledge*, on Cantor, Boltzmann, Gödel and Turing. Currently available at <http://video.google.com>. Just search for "dangerous knowledge."

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Note

¹ Gödel regarded Leibniz as a supreme intellect, an opinion that I have come to share. So if anyone knew the answer, it had to be Leibniz. Maybe the key idea was buried, unappreciated, somewhere in the thousands of pages of Leibniz's *Nachlass*. Maybe, Gödel thought in moments of despair, it had been discovered but deliberately suppressed by forces inimical to human intellectual and moral progress. Clearly, such forces are powerful. Just look at the mess out there!

Irreducible Mind: Toward a Psychology for the 21st Century by Edward F. Kelly, Emily Williams Kelly, Adam Crabtree, Alan Gauld, Michael Grosso, and Bruce Greyson. Lanham, MD: Rowman & Littlefield, 2006. 832 pp. \$99.95 (hardcover) ISBN: 0742547922.

This outstanding book is both a celebration and a continuation of F. W. H. Myers's pioneering and far-reaching empirical and theoretical research, which culminated in his monumental two-volume *Human Personality and Its Survival of Bodily Death* (generously included with the book on a CD). It succeeds admirably in demonstrating the considerable scope and profundity of Myers's work, and in fact, it makes a very strong case for regarding Myers as history's greatest psychologist. The book accomplishes this task by tackling head-on the question of whether everything that can or needs to be said about the mind and consciousness can be done solely with reference to physiological states (typically, states of the brain). Not surprisingly, the book's central contention "is that the science of the mind has reached a point where multiple lines of empirical evidence, drawn from a wide variety of sources, converge to produce a resolution of the mind-body problem along lines sharply divergent from the current mainstream view" (p. 1). So in the tradition of Myers, the authors survey in great detail a range of phenomena that Myers took very seriously and that seem difficult to accommodate in physicalist terms. They argue plausibly that an adequate psychology must comprehensively examine the full range of experiences and behavior falling within its domain—not simply those that are